

WHAT IS CLAIMED IS:

1. A cooling system for an enclosure containing heat-producing equipment, said cooling system comprising an air-to-liquid heat exchanger; wherein said heat exchanger absorbs heat from air exiting said enclosure and expels the heat outside an environment containing said enclosure.
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2. The cooling system of claim 1, wherein said heat exchanger further comprises an air vent, whereby air present in said heat exchanger is expelled when said heat exchanger is charged with liquid.
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3. The cooling system of claim 1, further comprising a fan situated to move air through said heat exchanger.
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4. The cooling system of claim 3, wherein said fan is selected from the group consisting of a centrifugal blower, a cross-flow blower, an axial fan and a plug fan.
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5. The cooling system of claim 3, wherein said heat exchanger and said fan attach to said enclosure.
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6. The cooling system of claim 1, further comprising a valve regulating refrigerated liquid flow through said heat exchanger.
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7. The cooling system of claim 6, further comprising:
a temperature sensor sensing a temperature of air exiting said heat exchanger; and
a temperature controller coupled to said sensor and modulating said valve to said temperature of said air exiting said enclosure a temperature approximately equal to the air in the environment.
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8. An enclosure containing heat-producing equipment, comprising:
an air inlet for admitting air from an environment containing said enclosure said
air absorbing heat from said equipment;
an air outlet for expelling heated air from said enclosure; and
5 an air-to-liquid heat exchanger adjacent to said air outlet, said heat exchanger
absorbing heat from said heated air and expelling said heat outside said
environment using a refrigerated liquid as a heat transfer medium.

9. The enclosure of claim 8, further comprising a fan disposed to force air through
10 said heat exchanger.

10. The enclosure of claim 9, wherein said fan is selected from the group consisting
of a centrifugal blower, a cross-flow blower, an axial fan and a plug fan.

11. The enclosure of claim 10, further comprising a modulating valve for regulating
15 refrigerated liquid flow through said heat exchanger.

12. The enclosure of claim 11, further comprising a temperature sensor sensing
temperature of the air exiting said heat exchanger and a temperature controller modulating
20 said valve in response to said temperature to ensure that the air exiting said heat
exchanger is at a temperature approximately equal to a temperature of said environment.

13. An enclosure containing heat-producing equipment, comprising:
an air inlet for admitting air from an environment containing said enclosure, said
25 air absorbing heat from said equipment,
an air outlet for expelling the air from said enclosure
means for exchanging heat from the air with a refrigerated liquid;
whereby the air returns to said environment at a temperature approximately equal
to the temperature of said environment.

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14. The enclosure of claim 13, further comprising means for moving the air through said means for exchanging heat.

15. A cooling apparatus for an enclosure containing heat-producing equipment, comprising:

an air-to-liquid heat exchanger installed in said enclosure, said heat exchanger absorbing heat from air passing through said heat exchanger and rejecting the heat outside an environment containing said enclosure; and
a fan disposed to induce airflow through said heat exchanger.

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16. A method for cooling an enclosure containing heat-generating equipment, the method comprising:

drawing air into said enclosure from an environment containing said enclosure;
passing the air in the vicinity of said heat-generating equipment to absorb heat from said equipment;

passing the heated air through an air-to-liquid heat exchanger, whereby a refrigerated liquid absorbs heat from the air;
returning the air to said environment; and
rejecting heat from said refrigerated liquid outside said environment containing said enclosure.

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17. The method of claim 16, further comprising modulating refrigerated liquid flow through the heat exchanger so as to regulate a temperature of said air returned to said environment at a temperature approximately equal to a temperature of said environment.

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Added Abo